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Food security and climate change: 4 per mille initiative new tangible global challenges for the soil.

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4 PER 1000 SOILS FOR FOOD SECURITY AND CLIMATE

BOOK OF ABSTRACTS

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A MODEL-BASED ASSESSMENT OF THE SOIL C STORAGE POTENTIAL AT THE NATIONAL SCALE: A CASE STUDY FROM FRANCE

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The recent controversy about the 4 per 1000 initiative has emphasized the need for a quantitative assessment of the C storage potential of agricultural soils. Moreover a clear distinction is required between the biophysically and the economically achievable potentials. Here we used a modelling approach at a fine spatial-scale resolution (< 8 km2) to quantify the additional C storage in agricultural soils of mainland France following the implementation, when feasible, of a range of soil C storing practices (i.e. cover crops, reduced tillage, new C inputs, grazing instead of mowing,…). The additional cost for farmers was also calculated, thus yielding the cost per Mg of additional C stored in soils. Results showed that the average additional C storage calculated over 30 years ranged between +0.028 and + 0.466 Mg C ha-1 yr-1 (i.e. between +0.5 and +7.2‰) for the different tested practices, with a very high spatial variability over France for each practice related to initial C stocks and pedo-climatic conditions. The storing practices where then ranked according to the cost of the additional C stored in soils (expressed in euro per Mg of C) and an optimal cost-efficient strategy was proposed at the national level.